

3½ mm. longis, sparse strigillosis, marginibus callosis, dense hirsuto-ciliatis; pappi squamis laceratis, 1 mm. vel minus longis.

Pericome glandulosa, n. sp. Perennial herbs a meter or more tall; stems branched, terete and striate, glandular and puberulent; petioles about 1 cm. long, leaf-blades broadly ovate to cordate, entire or nearly so, acuminate, 2–3, or rarely 4 cm. long, glandular and densely rough-puberulent beneath, somewhat less so above, palmately 3–5-ribbed; inflorescence of several-headed terminal corymbose cymes, peduncles 1–2 cm. long; involucre turbinate-campanulate, 5–6 mm. high, densely glandular-puberulent, bracts about 20, short-acuminate; corolla-tube 1½ mm. long, throat 3 mm. long; achenes narrowly oblong, about 3½ mm. long, sparsely strigillose on the faces, densely hirsute-ciliate on the calloused margins; lacerate scales of pappus a little less than 1 mm. long.—At foot of rock cliffs, 3 miles east of Kenton, Cimarron County, OKLAHOMA, August 27, 1934, *Goodman*, No. 2291, TYPE in the Gray Herbarium. ISOTYPE material may be found in the herbaria of the University of Oklahoma, Iowa State College, Missouri Botanical Garden, and elsewhere.

In summary, the new species is readily recognizable by the glandular pubescence, and by the leaves, which are shorter (2–3, rarely 4, cm. long) than are those of *P. caudata* (5–10 cm. long), and cordate, rarely deltoid, and by no means so caudate, characteristic leaves of *P. caudata* being shown as FIG. 2.

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MONOGRAPHIC STUDIES IN THE GENUS ELEOCHARIS. IV¹

H. K. SVENSON

(Plates 460–465)

1. Series: TENUISSIMAE²

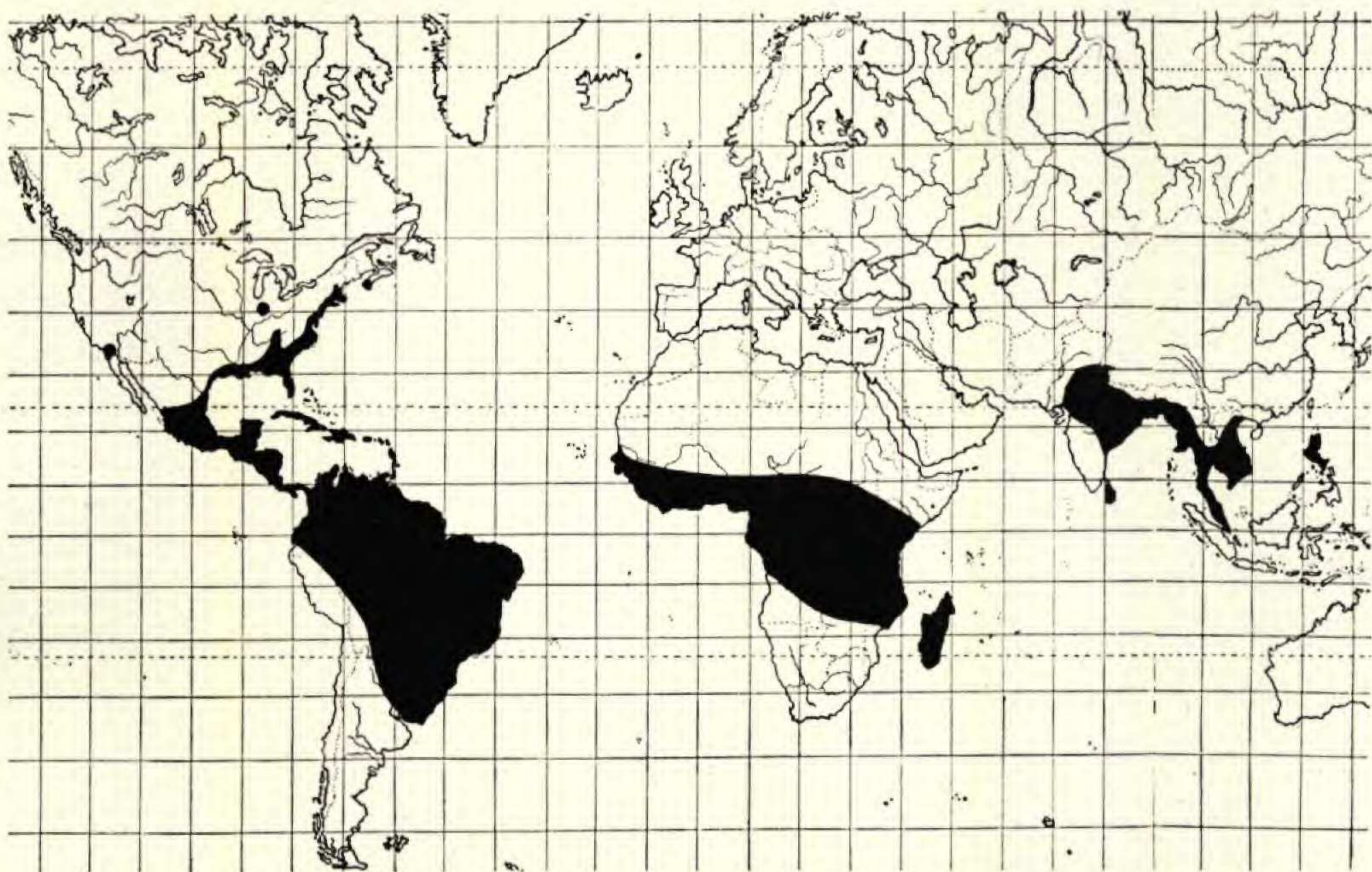
THIS series, primarily of dwarf tropical plants (MAP 1) inhabiting especially the sandy coastal plain of southeastern United States, the pine lands of western Cuba, and the warmer parts of South America, is also well represented in tropical Africa and in Madagascar; otherwise (except for the widespread *Eleocharis*³, series *Chaetariae* of

¹ Brooklyn Botanic Garden Contributions, No. 75. The cost of the plates is met by the Brooklyn Botanic Garden.—EDS.

² See RHODORA xxxi. 129 (1929).

³ Since no definite ruling has as yet been made I continue here the original spelling ELEOCHARIS instead of HELEOCHARIS. The confusion resulting from the latter spelling has already been mentioned by me (see footnote, RHODORA xxxi. 123 (1929)).

India and the Malay region) it is practically unknown in the Orient and is entirely lacking in Australia. In general, the diminutive size of the plants, the small trigonous achenes (except in *E. minima* var. *bicolor*) and usually punctate quadrangular-sulcate culms, make the group fairly well-defined. The nucleus is formed by the *Tenuissimae* C. B. Clarke, Kew Bull. Add. Ser. viii. 106 (1908), but the *Chaetariae* (l. c.) are intertwined and are not clearly separable. Through the transitional species, *E. retroflexa* and *E. tortilis*, the series has its culmination in *E. tuberculosa*, of larger stature than the other



MAP 1. Range of *ELEOCHARIS*, series *TENUISSIMAE*.

species, and characterized by a remarkable development of the style-base. *E. melanocarpa* probably belongs near the *E. Baldwinii*-*E. vivipara* group, but the relationship is obscure, and I have preferred to include it in the miscellaneous species, treated after the *Tenuissimae* in this paper. The *Tenuissimae* articulate through *E. sulcata* with a series of generally coarser plants, often with prominently elongated rootstocks and with larger achenes (ser. *SULCATAE*), well represented in Argentina and southern Brazil, including *E. pachystyla*, *E. pachycarpa*, *E. grandis*, *E. Niederleinii*, and, to me, a tangle of other species.

The smaller members of the *Tenuissimae* (especially *E. minima*, *E. nigrescens*, and *E. microcarpa*) have been the source of much confusion and misinterpretation, and in order firmly to establish the

synonymy of these obscure species, I have often found it desirable to illustrate (from the type specimen, whenever possible) the plants representing each name. These illustrations have been made by Miss MAUD H. PURDY, artist for the Brooklyn Botanic Garden. It may be added that the small species (and most of the larger species) of *Eleocharis* must be examined with a good binocular microscope. Magnifications of 30× and 54× have been found most satisfactory.

In the dwarf species of the *Tenuissimae*, and nowhere else in the genus, sessile basal spikelets are of frequent occurrence. These are found at the culm-bases, often so abundantly as to form scaly bulb-like masses. Each spikelet is 1-flowered, developing a single achene which is usually a little larger than the achenes produced in the normal spikelets (cf. PL. 465, FIG. 10). Similar basal spikelets have been described by Chermezon¹ in three Madagascar species of *Scirpus*, and are known also in several South African species of *Bulbostylis* (cf. *B. striatella*, Thistleton-Dyer, Fl. Cap. vii. 206 (1898)), and in the Mexican *Scirpus heterocarpus* Wats. Such spikelets, according to Chermezon, are perhaps the result of alternate immersion and emersion.

Work on this group has progressed intermittently over a period of years, and I have therefore had opportunity to study these particularly difficult species at leisure. Through the kindness of Dr. Merrill and Dr. Gleason of the New York Botanical Garden, I was able to examine the entire rich *Eleocharis* collection of that institution; to Professor Fernald and Mr. Weatherby of the Gray Herbarium I have also been in constant debt. Other curators of herbaria, both in this country and abroad, have been generous with time and specimens, as may be seen from the following institutions, in addition to our own (B), from which I have cited specimens:

- | | |
|---|--|
| (Alb)—New York State Museum,
Albany | (K)—Royal Botanic Gardens, Kew |
| (Ber)—University of California at
Berkeley | (NY)—New York Botanical Garden |
| (Cal)—California Academy of Sci-
ences | (Ost)—hb. Cornelio Ostén, Monte-
video, Uruguay |
| (Cam)—Cambridge University | (Ph)—Academy of Natural Sciences,
Philadelphia |
| (Can)—Canadian National Museum | (Pom)—Pomona College |
| (Cop)—Botaniske Museum, Copen-
hagen | (S)—Riksmuseum, Stockholm |
| (D)—Herbarium of C. C. Deam | (St. L)—Missouri Botanical Garden |
| (G)—Gray Herbarium, Harvard
University | (T)—University of Tennessee |
| (I)—University of Illinois | (US)—United States National Her-
barium |
| | (W)—University of Wisconsin |

¹ "Sur quelques *Scirpus* à épillets basicaules," Archives de Bot. Caen Bull. Mens. iii. 193-197 (1929).

The distributional maps, constructed almost wholly from specimens which I have examined, do not adequately represent the dispersal of several species in eastern Brazil, due to the few collections available to me from that area.

KEY TO ELEOCHARIS. SERIES: TENUISSIMAE

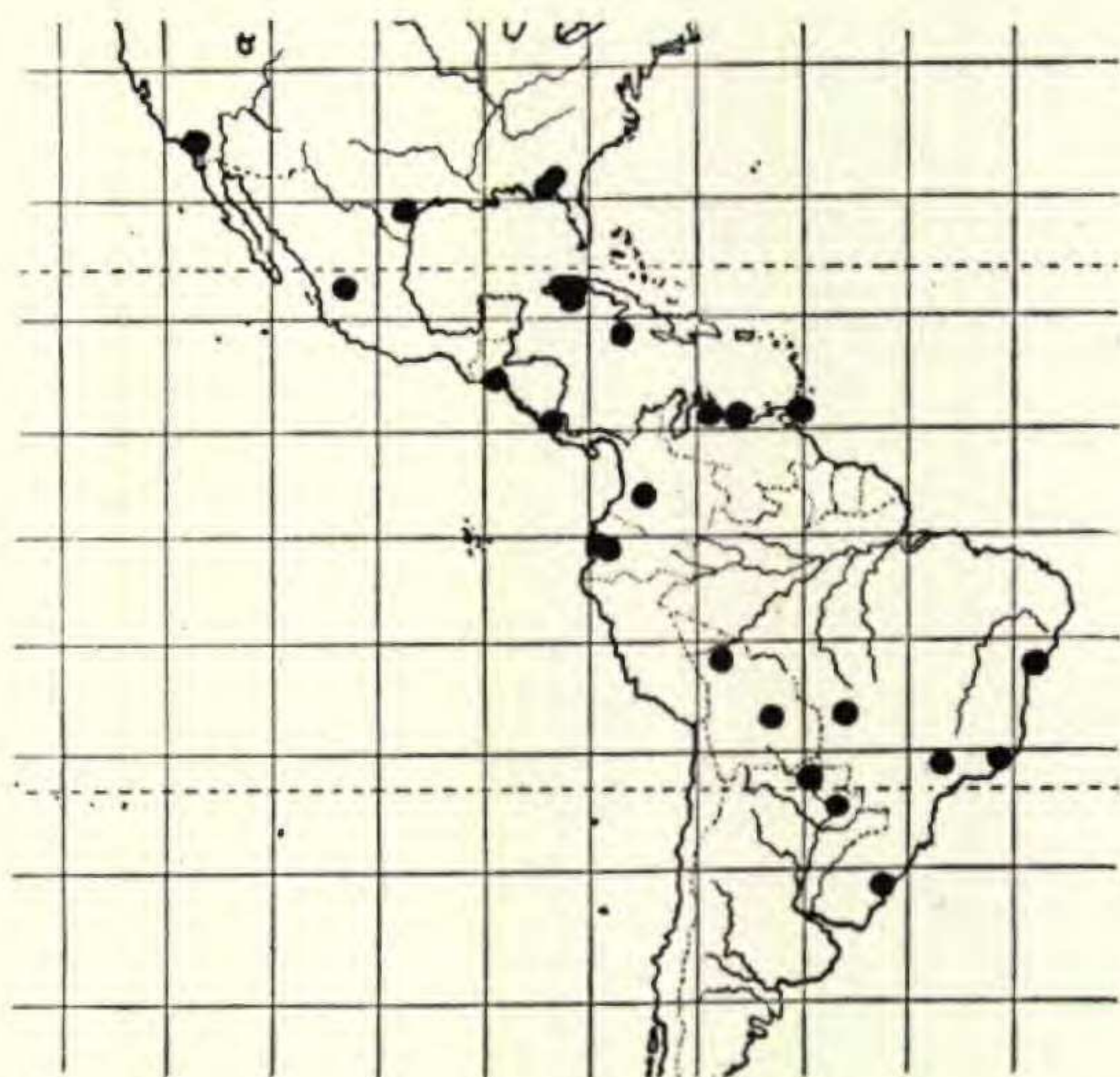
(Achene measurements include the style-base (tubercle))

- a. NEW WORLD SPECIES. . . . b.
- b. Achenes cancellate (i. e. with coarse deep-pitted reticulation) c.
- c. Achenes large, 2–3 mm. long (species of United States).
 Style-base mitriform, as wide as or wider than the achene. 19. *E. tuberculosa*
 Style-base conic-subulate, much narrower than the achene. 18. *E. tortilis*
- c. Achenes small to medium-sized, not exceeding 1.3 mm. long (species chiefly tropical) d.
- d. Aquatic plants with long stolons; achenes obovate-urceolate, 0.8 mm. long (Brazil) 11. *E. glauca*
- d. Plants without long stolons e.
- e. Achenes 1–1.3 mm. long f.
- f. Spikelets narrowly linear (scales only 3–4) (Cuba). 12. *E. alveolata*
- f. Spikelets lanceolate to ovate (many-flowered).
 Achenes obovate-urceolate, coarsely cancellate; style-base with angles decurrent on achene. 10. *E. retroflexa*
 Achenes obovate, finely cancellate; style-base pyramidal, without decurrent angles.
 Mature achenes gray to nearly black.
 Culms 1–3 dm. high, firm; spikelets linear-cylindric, usually proliferous (s. e. United States) 14. *E. vivipara*
 Culms 8–10 cm. high, flaccid; spikelets ovate-oblong (Cuba) 16. *E. grisea*
 Mature achenes brownish-iridescent, 1 mm. long (South America) 15. *E. subfoliata*
- e. Achenes 0.5–0.8 mm. long, whitish-iridescent when mature.
 Achenes 0.5 mm. long; pitting horizontally-elongated (Cuba) 17. *E. minutissima*
 Achenes 0.6–0.8 mm. long; pitting circular (Mexico) 8. *E. subcancellata*
- b. Achenes smooth to reticulate (not cancellate) g.
- g. Achenes biconvex (scattered trigonous achenes usually present) 1. *E. minima* var. *bicolor*
- g. Achenes trigonous h.
- h. Achenes medium-sized (0.8–1.3 mm. long) i.
- i. Spikelets few (2–6)-flowered, ovate; scales dark purplish-brown (Cuba) 6. *E. oligantha*
- i. Spikelets many-flowered (if 2–6-flowered, the spikelets linear).
 Style-base flat (with an apiculate center), as wide as the achene (Mexico) 2. *E. urceolata*
 Style-base conic or pyramidal (if depressed much narrower than the achene).

- Mature achenes glistening-white.
 Scales obviously distichous; achenes lightly pitted; style-base higher than broad. . . . 5. *E. amazonica*
 Scales not distichous; achene smooth; style-base broader than high. 4. *E. nana*
 Mature achenes pale gray to deep brown.
 Spikelets obviously distichous.
 Style-base subulate-tipped (s. e. United States) 13. *E. Baldwinii*
 Style-base pyramidal, obtuse. 1. *E. minima*
 Spikelets not distichous. . . . 9. *E. microcarpa* var. *filiculmis*
- h. Achenes small.
 Achenes 0.5–0.6 mm. long, white to faint buff, usually costulate.
 Style-base pyramidal to depressed-conic, narrower than the achene. 7. *E. nigrescens*
 Style-base flattened (apiculate in the center), as broad as the achene (Argentina) 3. *E. Barrosii*
 Achenes 0.6–0.7 (rarely 0.8) mm. long, light gray, not costulate. 9. *E. microcarpa*
- a. OLD WORLD SPECIES. . . . j.
- j. Achenes cancellate.
 Achenes medium-sized (1–1.5 mm. long).
 Spikelets 1-flowered; much-branched aquatic plant; style-base narrower than the achene. 26. *E. Naumanniana*
 Spikelets 3–10-flowered; plants cespitose; style-base as broad as the achene. 20. *E. Chaetaria*
 Achenes small (0.6 mm. long) 21. *E. Brainii*
- j. Achenes smooth to reticulate (not cancellate) k.
- k. Culms broad (0.5–1.5 mm. wide in dried material); achenes 0.8 mm. long. 24. *E. anceps*
- k. Culms capillary to filiform.
 Achenes medium-sized (1.0 mm. long).
 Style-base pyramidal; the angles not decurrent (Madagascar) 23. *E. caespitosissima*
 Style-base depressed-subulate; the angles decurrent on the achene (Senegal) 25. *E. trilophus*
 Achenes small (0.5–0.7 mm. long).
 Perianth-bristles present. 22. *E. Schweinfurthiana*
 Perianth-bristles lacking 7. *E. nigrescens*

1. *E. MINIMA* Kunth (PL. 460, FIGS. 1, 2, 3, 7; PL. 461, FIG. 1; PL. 465, FIGS. 6–10). MAP 2. Dwarf, 3–7 cm. tall, cespitose, with numerous whitish elongated fibrous roots: culms capillary, often recurving, quadrangular-sulcate, light green, punctate: sheaths conspicuous, light or dark brown, the apex inflated, blunt, hyaline: spikelets 2–4 mm. long, ovate, few- to many-flowered: scales ovate-lanceolate, mostly acute, dark brown with greenish midrib and hyaline margin: style 3-fid: achene ovate, 0.75–1.0 mm. long, sharply triangular with convex faces, whitish to pale or olivaceous brown, lightly reticulate to minutely striate, narrowed at the apex and base, capped by a brownish or gray, short-pyramidal style-base: bristles inconspicuous, transparent-white, obscurely toothed, shorter than the achene, often greatly reduced.—Enum. ii. 139 (1837) [Brazil] [PL. 1, FIG. 7]; Steud. Syn. Cyp. 75 (1855); C. B. Clarke, Bull. Herb. Boiss. ser. 2, iii. 1014 [Pl. Has-

slerianae 236] (1903) and Ill. Cyp. t. xxxii figs. 22–25 (1909); Kükenthal in Fedde, Rep. Spec. Nov. xxiii. 193 (1926); Standley, Field Mus. Publ. Bot. viii. 263 (1931); Ostén, Anales Mus. Nat. Hist. Montevideo, ser. 2a, iii. 176 (1932). *Chaetocyperus polymorphus* Lindley & Nees in Mart. Fl. Bras. ii¹. 94 (1842) (excluding α *depauperatus*) [Brazil]. *Chaetocyperus Jamesoni* Steud. Syn. Cyp. 74 (1855) [Ecuador] [PL. 1, FIG. 2]. *Heleocharis tenuissima* Boeckl. Linnaea xxxvi. 365 (1869–70). *E. Wrightiana* Boeckl. Cyp. Nov. i. 12 (1888) [PL. 1, FIG. 3]; C. B. Clarke in Urb. Symb. Ant. ii. 70 (1900) [Cuba], and in Bull. Herb. Boiss. ser. 2, iii. 1014 [Pl. Hasslerianae 236] (1903). *Eleocharis Durandii* Boeckl. All. Bot. Zeitschr. 1896. 34 (1896) [Costa Rica] [PL. 1, FIG. 1]. *E. oropuchensis* Britton, Bull. Torr. Club xlviii. 327 (1921) [Trinidad] [PL. 2, FIG. 1]. *E. Jamesonii* N. E. Brown in Kew Bull. 1921. 256 (1921).—Texas, California, West Indies, and southward throughout the tropics. TEXAS: in mud and on bark of old wood lying in the mud, Horseshoe Lake, Jackson County, *J. A. Drushel* no. 4153, Aug. 9, 1920 (B, St. L). CALIFORNIA: southern California, *Orcutt* no. 4584 (NY) (distributed as *E. disciformis* Parish). MEXICO: wet places on hills near Guadalajara, *Pringle* no. 4339 (B, NY) (as *E. subcancellata*). COSTA RICA: Cañas Gordas, alt. 1100 m., *Pittier* no. 10951, acc. to Clarke, Contr. U. S. Nat. Herb. x. 456 (1908) and Standley, Field Mus. Bot. Ser. viii⁴ 263 (1931). SAN SALVADOR: vic. San Vicente, alt. 350–500 m., *Standley* no. 21174 (NY). CUBA: margin of lagoon near Pinar del Rio, *C. Wright* no. 3369 (TYPE collection of *E. Wrightiana*) (G, NY); Laguna San Matéo, Pinar del Rio City, *Ekman* no. 18250 (S, NY); south of Mendoza, Pinar del Rio, *León & Roca* no. 6950 (NY); Guane, *León & Roca* nos. 7014 (NY), 7015 (NY); San Pedro, Isle of Pines, *Britton & Wilson* no. 15435 (NY) and *Britton, Wilson & Selby* no. 14461 (NY); Las Tunas, *Britton, Britton & Wilson* no. 14739 (G, NY). JAMAICA: Green Island, *Britton & Hollick* no. 2142 (NY). TRINIDAD: Oropuche Lagoon, *Britton, Hazen & Freeman* no. 1155 (TYPE of *E. oropuchensis*, NY); Siparia, *Broadway* no. 7897 (NY). VENEZUELA: Cumana, *Funck* no. 698 (K); Aragua, *Pittier* no. 10159 (NY). COLOMBIA: Neiva, Dept. Huila, alt. 550–600 m., *Rusby & Pennell* no. 1066 (K, NY). ECUADOR: savanna of Guayaquil, *Jameson* no. 369 (K, NY) (TYPE of *E. Jamesonii*); prov. Guayas, alt. 0–100 m., *Hitchcock* no. 20087 (G, K, NY, U). BOLIVIA:



MAP 2. Range of ELEOCHARIS MINIMA.

Apolo, 4800 ft., *R. S. Williams* no. 910 (NY); alt. 200 m., Velapo, *O. Kuntze* (K, NY); Buena Vista, Dept. Santa Cruz, *Steinbach* no. 5499 (NY). BRAZIL: Caldas, Minas Geraes, *Regnell* III no. 1307 (coll. *Lindman*) (S); Matto Grosso, *S. Moore* no. 530 (NY); in argillaceo humido, Cuyaba, Matto Grosso, *Malme* in 1902 (S) and 1903 (S); Lagoa, S. José dos Campos, *Löfgren* no. A359 (S); Santa Cruz, Rio Grande do Sul, *Regnell* II, 1112 (S). PARAGUAY: San Bernardino, *Rojas* no. 1061 (B, ex herb. Ostén); in regione cursus superioris fluminis Apa, *Hassler* no. 8345 (G); prope Puerte Carado, loco saepe inundato, *Regnell* no. A2295 (S); Colonia Risso pr. Rio Apa, *Regnell* no. 1062c (coll. *Lindman*) (S).

This little species of wide range and great abundance in tropical America, was poorly typified by Kunth,¹ who merely gave the indefinite location "Brasilia." My conception of the species, I believe, is much the same as that of Kükenthal (*Fedde, Rep. Spec. Nov.* xxiii. 193 (1926)) who likewise includes *E. Wrightiana* within the limits of *E. minima*. It comprises plants similar to *Funck's* collection from Cumana, which I examined at Kew, bearing C. B. Clarke's annotation "Compared with the type of Kunth and Boeckeler in h. Berlin." In general the achenes of *E. minima* are olivaceous brown, often fading to a pearly gray, the surface markings varying, as shown in Miss Purdy's drawings, from a light reticulum to an almost indistinguishable series of striations. The style-base is usually as broad as the apex of the achene; in this respect the material from western America (representing *E. Durandii* and *E. Jamesonii*) is especially homogeneous and quite similar to C. B. Clarke's illustration of *E. minima* (l. c.).

The specimen illustrated in PLATE 460, FIG. 7 was determined as *E. minima* by C. B. Clarke, and tends toward the condition seen normally in *E. Wrightiana* and *E. oropuchensis*, both of which have the identical outward appearance of material from western South America (*E. Jamesonii*), and are without question merely narrow-tubercled forms of *E. minima*.² However, great variation in achene and style-

¹ *E. MINIMA*. Perpusilla; caespitosa; culmis setaceis, basi vaginatis, aphyllis; spica solitaria, ovata, biflora; squamis 4, carinato-navicularibus, ovatis, obtusis, uninerviis, dorso atro-sanguineis, nervo viridi, sub apice evanescente, apice margineque hyalino-albidis, infima vacua; stylo profunde trifido; achenio subrotundo-obovato, trigono, angulis prominulis, laevi, olivaceo, nitido, basi styli abbreviata pallida terminato; setis nullis.—Brasilia.—Planta subsemipollicaris.

² Whether *E. mexicana* Palla (*Oesterr. Bot. Zeitsch.* lxiii. 402 (1913), from Morelia, Michoacan), based on a collection by Arsène, said to differ from *E. minima* by a larger achene and a style-base "pfriemformig (aufgeweicht schmallanzettlich), spitz, braunlich oder schwartzlich, kaum $\frac{1}{4}$ mm. hoch.", belongs with *E. minima* I do not know, nor have I seen *Schaffner* no. 22 from Mexico upon which Pfeiffer based *E. minima* var. *mexicensis* (*Herbarium*, no. 56, 55 (1921)).

base may be found in the same collection (cf. PL. 460, FIG. 2; PL. 465, FIGS. 9, 10, all from *Hitchcock* no. 20087, Ecuador).

Some of the material from southern Brazil, perhaps referable to *E. tenuissima*, has also a higher and narrower style-base than is characteristic of the species throughout the larger part of its range. *E. tenuissima* was a renaming of *Chaetocyperus viviparus* Nees¹ in Mart. Fl Bras. ii¹ 93 (1842), not *Eleocharis vivipara* Link (1821), and the descriptions of both Nees and Boeckeler seem to be based primarily on Sellow's collection from Brazil. A Sellow specimen which I examined at Kew bore the added notation "*Eleocharis exigua* R. & S.?" and is, I believe, merely a form of *E. minima* with loose open spikelets, with achenes sharply angled, light olive-gray, faintly iridescent, smooth to slightly striolate, and with a narrow style-base much as described by Boeckeler "rostro triquetro caryopsi $\frac{1}{2}$ brevior e basi pyramidalis acuminato, fuscescenti." Whether this specimen is the equivalent of Nees' *Chaetocyperus viviparus* I cannot state with certainty, but until further evidence accumulates for separating such material from *E. minima*, I prefer to treat *E. tenuissima* as a synonym of *E. minima*.

At Kew is also a collection from Guadeloupe (*Bertero*) which undoubtedly represents the second collection cited under *E. tenuissima* by Boeckeler. This specimen, which I believe to be a diminutive unfruitful *E. retroflexa*, is the basis of the synonymy "*Eleocharis proliferata* Torrey! and *Heleocharis tenuissima* Boeck.!" cited by Clarke under *Eleocharis camptotricha* var. *Schweinitzii*,² and therefore the origin of the tangled thread erroneously carrying "*Eleocharis proliferata* Torr." into South America (cf. Ostén, Anales Mus. Nat. Hist. Montevideo ser. 2^a, iii. 177 (1932)). With some hesitation, Clarke identified an immature specimen of *Hassler* no. 3659 (Paraguay) as *E. tenuissima* (cf. Bull. Herb. Boiss. ser. 2, iii. 1016 (1903), an inter-

¹ *Chaetocyperus viviparus* Nees in Martius, Fl. Bras. ii¹. 93 (1842).

"*Chaetocypero polymorpha* simillimus ut formam ejus anomalam credissem, nisi basis rostri dimidii fructus longitudina persistens rostrum conicum referret, quae contra in illo tuberculum depresso-conoideum breve apice mucronulatum refert. . . .

In Brasiliae orientalis humidis inundatis legerunt *Sellow, Pohl*;—in Minarum prov.: M."

² Urban, Symb. Ant. ii. 69 (1900). The chief element in the description of *E. camptotricha* var. *Schweinitzii* was *Northrop* no. 524b which is *E. bahamensis* (see RHODORA xxxi. 230 (1929) and Clarke's annotations accompanying the nondescript specimen in the herbarium of the New York Botanical Garden show that he considered this specimen, quite erroneously, the equivalent of the *Bertero* material from Guadeloupe.

pretation which has further confused the situation in South America.¹ I find material labelled *E. tenuissima* to be generally misidentified, for example, *André* no. 4279¹, San Sablo (Nova Granata) (G, NY) is *E. retroflexa*, while *N. Taylor* no. 391, Higuey, Santo Domingo (NY), a proliferous member of the *E. minima-E. alveolata* group, is in too poor condition for any determination. In Brazil, *E. minima* seems to pass directly into the aquatic phase known as

Var. AMBIGUA (Steud.) Kükenthal in Fedde, Rep. Spec. Nov. xxiii. 194 (1926) (as to name-bringing synonym only), [see var. *bicolor*]. *Chaetocyperus polymorphus* Lindley & Nees γ^* *natans* Nees in Mart. Fl. Bras. ii¹. 95 (1842). (PL. 460, FIG. 4). *Isolepis ambigua* Steud. Cyp. 91 (1855). *Eleocharis subtilis* Boeckl. Linnaea xxxvi. 426 (1869-70).

The specimen of *Scirpus ambiguus natans*, collected by Salzmann at Bahia, and represented in the Lindley Herbarium at Cambridge, is the sole basis for the names *Chaetocyperus polymorphus* γ *natans* Nees and *Isolepis ambigua* Steud. This collection, examined by me at Cambridge, consists of somewhat distichous-spiked dwarf plants with olivaceous trigonous achenes, the scales darker and more spreading than in *E. nana* with which it has been confused, and quite different from the Trinidad material collected by Crueger (det *E. minima* var. *ambigua* by Kükenthal), referred by me to var. *bicolor*. The illustration (PL. 460, FIG. 4) represents a habit-drawing of *Gross* no. 20513 (G) from Brazil, which closely resembles the Salzmann specimen, and the achene-drawing is from a sketch made by me from the Salzmann collection at Cambridge. *Chaetocyperus polymorphus* is a well recognized *nomen confusum*,² and the varietal name (i. e. *natans*) is in itself a *nomen subnudum*. *E. subtilis* Boeckl. was based on a *Beyrich* specimen from Brazil, with achenes described as "*depresso-obovata triangulari, angulis costuliformibus, infra apicem leviter constricta . . . rostro concolorato, perbrevis pyramidato triangulari*," *Scirpus ambiguus natans* being given as a synonym. *Beyrich's* collection labelled "*Scirpus ambiguus natans, Bahia, in aquis leviter fluentibus*" (and,

¹ The beautiful figures of *H. tenuissima* drawn by Barros, *Anales Mus. Hist. Nat. Buenos Aires* xxxiv. 452, f. 12 (1928), were probably influenced by C. B. Clarke's determinations, and illustrate a plant with long slender culms, creeping rootstock and thick-tubercled achene, evidently a different thing than the *E. tenuissima* under discussion.

² A "catch all," for small species, comprising, so far as I can interpret, the following elements:

" α *Depauperatus*," based on *Cyperus depauperatus* Vahl = *E. retroflexa*; " α^* *Minimus*," based on *E. minima* Kunth; " β *Sphagnicola*," based on *Scirpus ambiguus sphagnicola* Hb. Lindley = *E. nana*; " γ *Capillaceus*," based on *Scirpus capillaceus* Michx. = *E. acicularis*; " γ^* *Natans*," based on *Scirpus ambiguus natans* Hb. Lindley.

according to C. B. Clarke, representing the type collection), examined by me at Kew, has capillary culms 2–3 dm. high, spikelets 5–6 mm. long, with dark chestnut scales, and unquestionably represents the aquatic phase of *E. minima*. In southern United States and on the island of Trinidad, extraordinary plants are found, in which the majority of achenes are lenticular, representing

Var. **bicolor** (Chapman) n. comb. (PL. 462, FIGS. 1–3). Cespitose, sometimes with slender elongate rootstocks: culms spongy, nearly terete to quadrangular-sulcate, punctate: sheaths stramineous, often a little inflated at the summit, as in typical *E. minima*: spikelets ovoid, 2–4 mm. long, loosely many-flowered: scales 2 mm. long, obtuse to emarginate, with green keel, brown sides and hyaline margin: style 3-fid: *achene obovoid*, 0.7 mm. long, *lenticular* or trigonous, white to stramineous, smooth to lightly reticulate: style-base olivaceous to dark brown, nearly as wide as the achene, flattened-apiculate to short-pyramidal: bristles white, rudimentary to half as long as the achene.—*E. bicolor* Chapman, Fl. S. United States 517 (1860). *Scirpus exiguus* Griseb. Fl. Br. W. Ind. 569 (1864), not HBK. Nov. Gen. et Sp. i. 225 (1816), which is a high Andean representative of *E. acicularis*. *E. subtilis* Clarke in Urb. Symb. Ant. ii. 71 (1900), not Boeckl. *E. Wrightiana* C. B. Clarke, Urb. Symb. Ant. ii. 70 (1900) in part. *E. savannarum* Britton, Bull. Torrey Club xlviii. 327 (1922). *E. minima* var. *ambigua* (Steud.) Kükenthal in Fedde, Rep. Spec. Nov. xxiii. 194 (1926), as to plant cited, not *Isolepis ambigua* Steud. Cyp. 91 (1855). *E. uncialis* Chapman ex Small, Man. 163 (1933) [PL. 3, FIG. 3, triangular achene]. Wet pine barrens, Georgia and Florida; Trinidad. GEORGIA: pine barrens south of Fitzgerald, Irwin County, *R. M. Harper* no. 1711 (NY); wet pine barrens north of Moultrie, Colquitt County, *Harper* no. 1665 (NY). FLORIDA: Quincy, *Chapman* in 1836 (TYPE, NY); damp pine barrens, *Chapman* (TYPE of *E. uncialis*, NY). TRINIDAD: moist hole on the O'Meara Savanna, *Britton* no. 2491 (TYPE of *E. savannarum*, NY); Savanna O'Meara, *Crueger* no. 48 (K).

In the collections of both *E. savannarum* and *E. uncialis*, trigonous and lenticular achenes may be found in the same spikelet, the trigonous achenes being inseparable from those of *E. minima*. *Crueger's* Trinidad specimen at Kew, bearing C. B. Clarke's notation "This was marked by Boeckeler in hb. Berlin *E. Wrightiana* and I think is that," is identical with Britton's type of *E. savannarum*.

2. *E. urceolata* (Liebm.) n. comb. (PL. 460, FIG. 5). Densely cespitose; culms finely capillary, 3–7 cm. high, dull green, punctate and obscurely quadrangular-sulcate; sheaths purplish, a little inflated at the summit; spikelets 2–3 mm. long, ovate (occasionally narrowly oblong and fewer-flowered), 6–11 flowered; scales spreading in fruit, keeled, green with purplish sides and hyaline margins; style 3-fid;

achenes triangular, costulate, 0.8 mm. long, *urceolate-obovate*, *truncate at the apex*, pale gray to brownish yellow, faintly striate-reticulate to smooth; *style-base flat*, *apiculate in center*; bristles none.—*Chaetocyperus urceolatus* Liebm. in Vidensk. Selsk. Skr. ser. 5. ii. 243 (1851). *Eleocharis Liebmanniana* Boeckl. Linnaea xxxvi. 439 (1869–70).—MEXICO: savanna swamps, [Hacienda de] Mirador, Potrero de Consoquitla,¹ Liebmann (G, TYPE coll. of *C. urceolatus*); Palmer no. 7069 (G).

Liebmann differentiated *C. urceolatus* from *Chaetocyperus punctatus* Nees (*E. nana* Kunth), but I believe the relationship is closer to *E. nigrescens*.

Eleocharis Liebmanniana Boeckl. (based on Liebmann no. 603 from Mirador) was characterized by "caryopsi minutissima . . . angulis prominulis, *tuberculato-rugulosa* albida margaritaceo-nitidula; tuberculo brevissimo conico annulo rugoso circumdato." In reading over Liebmann's text, I find no record that any species of *Eleocharis* other than *Chaetocyperus urceolatus* and the wholly distinct *E. nodulosa* were collected at Mirador, and I believe that *E. Liebmanniana* should, from this fact and the similarity of Boeckeler's description, be placed in the synonymy of *E. urceolatus*. However, I may be wrong in this assumption, for we have not, by any means, solved the tangle of Mexican species associated with *E. nigrescens*. For example, Palmer's no. 294 from Mexico (G) (labeled *E. Liebmanniana*) has grayish achenes 0.8 mm. long, which are strongly cancellate and with prominent costulate angles, evidently not *E. urceolata*. What *Heleocharis aurea* Boeckl. Cyp. Nov. i. 15 (1888) represents I do not know; the collection, from San Luis Potosi, Schaffner no. 212, is said to be related to *E. Torreyana*.

3. *E. Barrosii* n. sp. (PL. 462, FIG. 4), annua, cespitosa, culmis capillaribus tenuibus proliferis *E. minimae* similis; culmis 3–10 cm. longis, obscure sulcatis; vaginis laete brunneis ad apicem paulo inflatis, scariosis; spiculis ovatis, 2–4 mm. longis, subdistichis, laxe pauce-vel multifloris; glumis acutis, 2 mm. longis, carinatis, in carina viridis, latere castaneis, margine late hyalinis; stylo 3-fido; achaeniis trigonis, costulatis, obovato-urceolatis, laevibus, 0.6 mm. longis, albidis vel olivaceis, apice truncatis; stylo-basi multo depresso in medio paulo apiculato; setis nullis vel rudimentariis.—ARGENTINA: Formosa, Jørgensen no. 3310 (TYPE in Gray Herb.).

¹ These names do not appear on any maps available to me, but from notations by Liebmann (l. c. p. 207, p. 215, etc.) it is evident that both localities lie in the warm temperate region of the east side of Mexico at an altitude of 3000 and 2500 feet respectively. A specimen of *E. nodulosa* in the Gray Herbarium has the notation "Hidalgo, Mirador."

This clearly distinct little species differs from *E. minima* in having elongated culms and much smaller achenes, truncate at the apex. The achene is also much smaller than in *E. urceolata*. The name is associated with *Dr. Manuel Barros*, the distinguished writer on *Cyperaceae* of Argentina, to whom I am much indebted for helpful information and specimens.

4. *E. NANA* Kunth (PL. 462, FIG. 12). MAP 3. *Erect* cespitose annual (?) with *coarse whitened roots*; culms 4–12 cm. long, glaucous-green, punctate, irregularly sulcate; sheaths stramineous, often marcescent, the apex appressed-acute to somewhat inflated; spikelets ovate to elliptic, 3–4 mm. long, 5–8-flowered; scales greenish to stramineous, keeled, apex and margin hyaline; style 3-fid; *achene sharply trigonous to costate*, 1–1.3 mm. long, greenish, becoming pearly when mature, *obscurely reticulate*; style-base deep olive to brown, short-pyramidal with an acuminate tip; bristles colorless to light brown, exceeding the achene.—Enum. ii. 140 (1837); Kükenthal in Fedde, Rep. Spec. Nov. xxiii. 193 (1926). *Chaetocyperus punctatus* Nees in Mart. Fl. Bras. ii¹. 93 (1842). *Heleocharis punctata* Boeckl. in Kjöb. Vidensk. Meddel. 1869: 132 (1869–70); Linnaea xxxvi. 420 (1869–70); not *Eleocharis punctata* Hochst. ex Steud. Cyp. 75 (1855) which is *E. sulcata*. *Eleocharis punctata* C. B. Clarke in Urb. Symb. Ant. ii. 69 (1900). *Scirpus camptotrichus* C. Wright in Sauvalle Fl. Cubana 172 (1873). *Eleocharis camptotricha* C. B. Clarke in Urb. Symb. Ant. ii. 69 (1900).—Florida, West Indies, South America. Specimens examined: FLORIDA: bog mat, Lake Lynch marsh, Winter Haven, Polk County, *J. B. McFarlin* no. 3988

(B); cypress swamp, Polk City road, Winter Haven, *McFarlin* no. 5793 (B). CUBA: *C. Wright* no. 3767 (G). BRITISH GUIANA: Penal Settlement, *A. S. Hitchcock* no. 17099 (G, NY); *Jenman* no. 6112 (NY). BRAZIL: *Burchell* no. 3137 (G); Jacarehy, *Dusén* no. 17011 (TYPE coll. of *E. Dusenii* Pfeiff.) (G); Jacarehy, *Dusén*, no 118a (NY); St. Vincente, Prov. S. Paulo, *Mosén* no. 3724 (S); in paludibus, Pirahy, Paraná, *Dusén* no. 3031 (S); Taquerembo, Rio Grande do Sul, *Lindman* no. A1537 (S); Iguape, S. Paulo, *Hoehne* no. 24281 (G).

According to Kükenthal (l. c.) who has examined the type of *E. nana* (*Gaudichaud* no. 3195, Rio de Janeiro), *E. camptotricha* C. B. Clarke and *H. punctata* Boeckl. are synonyms of *E. nana*, which is distinguished from *E. minima* primarily by the taller, more rigid culms and larger achenes.



MAP 3. Range of *ELEOCHARIS NANA*.

5. *E. AMAZONICA* C. B. Clarke (Pl. 461, FIG. 9). MAP 4. *Erect* from a slender, much-branched vertical rootstock, *sometimes with slender, elongated rhizomes*; culms 8–10 cm. long, filiform, *dull green, wiry, punctate, deeply striate to irregularly sulcate*; sheath dull brown, scarious, somewhat acute at the apex; spikelets ovate to lanceolate, 4–7 mm. long, *distichous*, about 10–15-flowered; scales obtuse, thin, appressed, punctate on the obscure greenish keel, light brown to greenish on the sides, with a broad scarious margin, the lower scale greenish, erect, *simulating a continuation of the culm*; style 3-fid; achene obovate, 0.8–1 mm. long, trigonous, *costulate, shining white*, smooth to obscurely reticulate; style-base light brown, pyramidal, $\frac{1}{3}$ the width of the achene; bristles rudimentary to half as long as the achene, lightly retrorse-toothed.—



MAP 4. Range of *ELEOCHARIS AMAZONICA*.

greenish on the sides, with a broad scarious margin, the lower scale greenish, erect, *simulating a continuation of the culm*; style 3-fid; achene obovate, 0.8–1 mm. long, trigonous, *costulate, shining white*, smooth to obscurely reticulate; style-base light brown, pyramidal, $\frac{1}{3}$ the width of the achene; bristles rudimentary to half as long as the achene, lightly retrorse-toothed.—

Kew Bull. Add. Ser. viii. 22 (1908).—BRAZIL: in vicinibus Santarem, Prov. Pará, (*Scirpidium*) (2) Spruce in May 1850 (TYPE coll.) (Cop, G, NY), and

in Sept. 1850 (S); ad flumen Guainio v. Rio Negro supra ostium fluminis Casiguari, Spruce in 1854 (no. 3757, distributed as *E. polymorpha* Nees (var. ?) (NY); open sandy flats about Sao Lopez, Fortaleza, Ceará, Drouet no. 2454 (G, B). VENEZUELA: Esmeralda, Tate no. 258 (juvenile) (NY).

Although of coarser appearance and with wholly different spikelets, *E. amazonica* is nevertheless most closely related to *E. nana*. The latter species has larger, less costulate achenes which have merely a smooth to lightly reticulate surface and are not punctulate as in *E. amazonica*.

6. *E. OLIGANTHA* C. B. Clarke (Pl. 460, FIG. 6). MAP 5. *Dwarf, densely matted*, often proliferous annual; culms *finely capillary*, 2–5 cm. high, often recurved or prostrate, punctate, quadrangular-sulcate: sheath stramineous to reddish, scarious and slightly inflated at the apex; spikelets 1–3 mm. long, *ovate, 2–6-flowered: scales dark purplish-brown, keeled, spreading in fruit*: style 3-fid: achene 1 mm. long, trigonous, sharply-angled, whitish, becoming gray to dark olive-brown when ripe, faintly punctate-reticulate: style-base usually lighter, pyramidal, acute, somewhat 3-crested at base with overhanging projections: bristles hyaline, obscurely retrorse-toothed, rudimentary to nearly as long as the achene.—Urb. Symb. Ant. ii. 69 (1900); Kükenthal in Fedde, Rep. Spec. Nov. xxiii. 193 (1926). *Scirpus retroflexus* Griseb. Pl. Cub. 239 (1866) and Sauvalle, Fl. Cubana 174 (1873) acc. to Clarke (l. c.). *Heleocharis prolifera* Kükenthal in Fedde, Rep. Spec.

Nov. xxiii. 193 (1926) in part, not Torr.—Muddy places in pinelands and savannas, Cuba. The species was based on *C. Wright* nos. 3367, 3368 in herb. Kew. Specimens examined: Without further location: *C. Wright* nos. 3367 (G, in part), and 3368 (G, NY). PINAR DEL RIO: vic. Pinar del Rio, *Britton, Britton & Gager* no. 7234 (NY); *Ekman* no. 17947 (G). ISLE OF PINES: Santa Ana, *Britton & Wilson* no. 15688 (G, NY). SANTA CLARA: El Cumbre, *Ekman* no. 18978 (G, NY); Laguna Pozo Grande, Mordazo, *Ekman* no. 17038 (NY); Sabana de Monasterio, *León* no. 9216 (NY); Mordazo, *León & Cazañas* no. 5946 (NY); Manacas, *León & Cazañas* nos. 5813 (NY) and 5861 (NY); Sabana de Motembo, *León* no. 11382 (NY); at the mines of Motembo in the water of the crater, *Ekman* no. 16858 (N, S).¹ CAMAGUEY: La Gloria, *Shafer* nos. 293 (NY), 613 (G, NY).



MAP 5. Range of *ELEOCHARIS OLIGANTHA*.

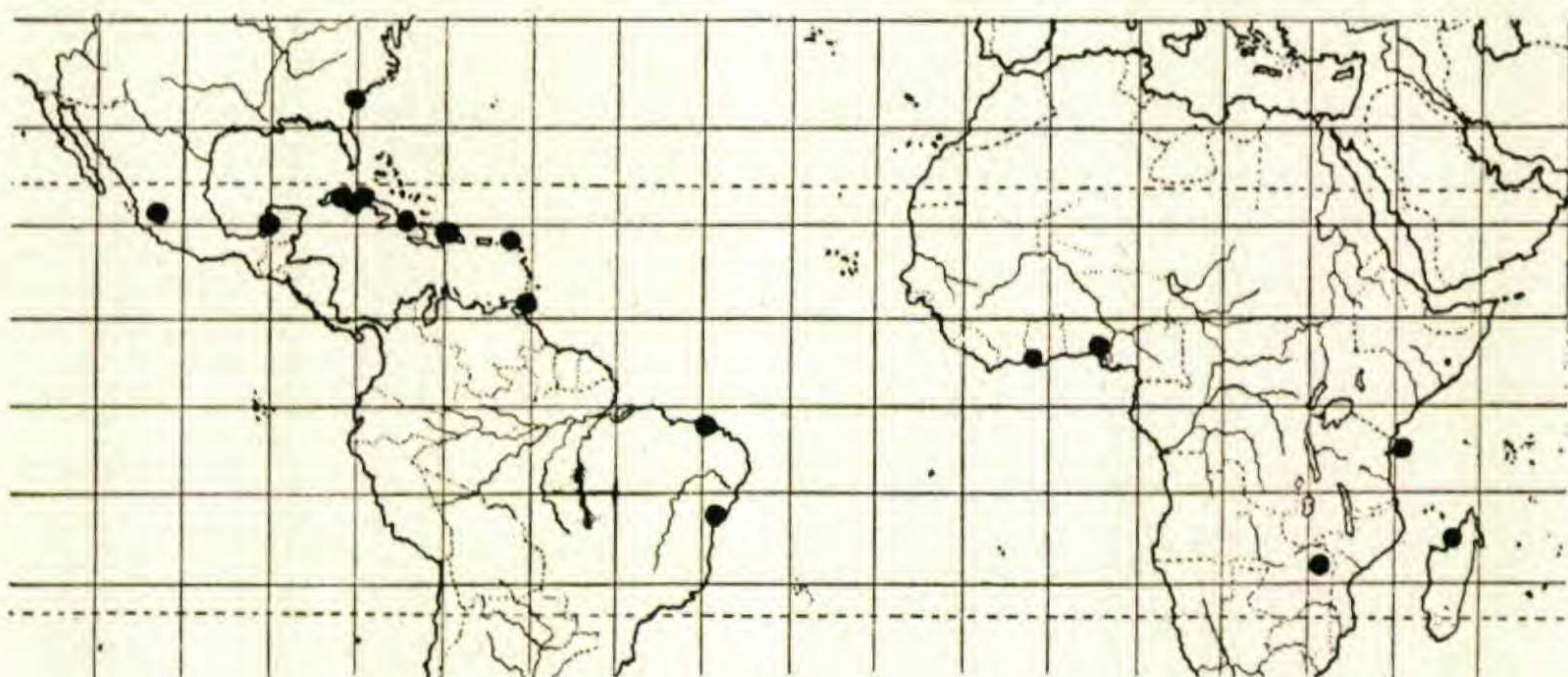
Dr. Kükenthal (l. c.) has differentiated this well marked little species from *E. minima* not only by the shorter and darker scales but also by the wider pyramidal style-base, which, it may be added, usually is 3-pronged at the base.

7. *E. NIGRESCENS* (Nees) Steudel (Pl. 462, FIGS. 5, 6, 7). MAP 6. Cespitose annual with fibrous roots, or perennial with lignescent (usually whitened) vertical much-branched rootstocks: culms filiform, erect, 3–7 cm. high, obscurely quadrangular-sulcate, punctate: sheath red (sometimes greenish), the apex marcescent or sometimes projecting into an attenuate appressed appendage 1–2 mm. long: spikelets many-flowered, ovoid, 2–5 mm. long; scales chestnut-brown with a greenish midrib, obtuse to emarginate, scarcely keeled, spreading at maturity; style 3-fid; achenes trigonous, 0.5–0.6 mm. long; the mature achenes² (*i. e.* those at the base of the spikelet), smooth, semitranslucent, light yellowish brown with prominent costulate whitened opaque angles; immature achenes (or at least those at the middle part of the spikelets) opaque, white, with obscure striolate reticulation and a pearly lustre and with less costulate angles; style-base brown to light gray, pyramidal (or occasionally depressed, acute), 1/3 as wide as the achene; bristles none.—Syn. Cyp. 77 (1855). *Eleocharis nigrescens* Kunth, Enum. ii. 157 (1837) (nomen); C. B. Clarke, Ill. Cyp. t. xxxviii, f. 1–4 (1909); Kükenthal in Fedde, Rep. Spec. Nov. xxiii.

¹ This proliferous specimen, nearly 3 dm. long, was determined by Dr. Kükenthal as *H. prolifera* Torr. It has somewhat the aspect of *Scirpus submersus* C. Wright, but the spikelets and achenes (basal) are typical of *E. oligantha*.

² The achenes are here described from the *type* collection. Only one stamen was seen in the flowers examined.

194 (1926). *Scirpidium nigrescens* Nees, *Linnaea* ix. 293 (1843) (nomen) and in *Mart. Fl. Bras.* ii¹. 97 (1842). *Isolepis nigrescens* Steud. *Syn. Cyp.* 91 (1855). *Scirpus microlepis* Grisebach, *Cat. Plant. Cubens.* 239 (1866). *Heleocharis atropurpurea* var. γ Boeckl. *Linnaea* xxxvi. 459 (1869-70). *E. Hildebrandtii* Boeckl. *Flora* lxi. 34 (1878); [PL. 462, FIG. 6]; C. B. Clarke in Durand & Schinz, *Consp. Fl. Afr.* v. 598 (1894) and in Thistleton-Dyer, *Fl. Trop. Afr.* viii. 409 (1902). *E. complanata* Boeckl. *Flora* 1879. 562 (1879); C. B. Clarke in Durand & Schinz, *Consp. Fl. Afr.* v. 598 (1894) and in Thistleton-Dyer, *Fl. Trop. Afr.* viii. 409 (1902); Chermeson, *Archives de Bot. Caen* iv. Mém. no. 7. 42 (1931). ?*E. Perrieri* Chermeson, *Bull. Soc. Bot. France* lxxiii. 554 (1926). *E. carolina* Small, *Man. S. E. Fl.* 165



MAP 6. Range of ELEOCHARIS NIGRESCENS.

(1933).—South Carolina to Mexico and Brazil; Tropical Africa and Madagascar. SOUTH CAROLINA: damp pineland soils, Santee Canal, *Ravenel* (NY) (TYPE of *E. carolina* Small). MEXICO: wet places, Guadalajara, *Pringle* no. 2627 (NY). CUBA: south of Guane, Pinar del Rio, *León & Roca* no. 6997 (NY); Oriente, Sabana San Felipe, *Ekman* no. 2408c (NY); *C. Wright* no. 3370 (G, NY) (TYPE coll. of *S. microlepis* Griseb.). SANTO DOMINGO: *Wright, Parry & Brummel* no. 580 (NY). TRINIDAD: *Piarco, Broadway* no. 2143 (B). BRAZIL: Bahia, in maritimis [*Salzmann* (?)] (TYPE in hb. Lindley, Cambridge Univ.); Piauhay, *Gardner* no. 2374 (G, NY). ZANZIBAR: *Hildebrandt* no. 1063 (K, COTYPE of *E. Hildebrandtii*); *Kirk* in 1872 (K). ANGLO-EGYPTIAN SUDAN: (southwestern); "Terr. Bongo," *Schweinfurth* no. 2576 (K, COTYPE of *E. complanata*). RHODESIA: Salisbury, alt. 4800 ft., *C. K. Brain* no. 8971 (K, B). IVORY COAST: Districte de Toumode, *Chevalier* no. 22376 (K). S. NIGERIA: Lagos, *Dalziel* no. 1297 (K); rice fields, *Barter* no. 1574 (K). MADAGASCAR: Majunga, *Perrier de la Bâthie* no. 17947 (B).

The currently accepted publication of this widespread plant consisted wholly of two *nomina nuda*. Valid publication (as *Scirpidium*

nigrescens), began with Nees in 1842, who cited *Scirpus nigrescens* in Lindley's herbarium, and the first legitimate use of the name *Eleocharis nigrescens* was apparently by Steudel in 1855. The type specimen, so accurately and carefully described by Nees, I have examined through the kindness of Dr. Seward, and the achenes are as Nees states "matura fere laevis, sordide lutescens, juvenilis cum siccetur subtilissime punctulato-striata pallidiorque."

The type is a small annual closely simulating *E. atropurpurea*, to which it was united by Boeckeler, but is clearly transitional to coarse-rooted perennial plants with identical achenes, such as the collection by León & Roca (no. 6997) figured by Miss Purdy (PL. 3, FIG. 5). The achenes of *E. nigrescens* do not have the consistency in markings found so regularly in species of larger stature, and Clarke's illustration of *E. nigrescens* (Ill. Cyp. t. xxxviii. 1909) was without question a drawing of an immature achene showing a reticulation rarely seen in the more mature achenes of Wright's collection (no. 3370 from Cuba), which includes specimens of such variability that the extremes might well be considered as representing entirely different species. Small greenish plants with minute spikelets, fruit-bearing, though often only 1.5 mm. long and 5-6-flowered, intergrade with the larger purplish-scaled material [typical *E. nigrescens*, described by Grisebach from this collection as *Scirpus microlepis*]. These plants no doubt reflect diverse ecological conditions. Though apparently mature, Ekman no. 2408^b has lightly reticulate achenes, not costulate and with a depressed style-base. It was correctly determined as *E. nigrescens* by Kükenthal.

Ravenel's little plant from South Carolina, undoubtedly the basis of Britton's citation (Journ. N. Y. Mic. Soc. v. 107. 1889) of *E. bicolor* from South Carolina, "Santee Canal, Ravenel in 1848" was noted by Dr. Small's keen eye as distinct from any other material collected in the United States, and named by him *E. carolina*. It is identical with the larger plants of Wright no. 3370.

The African plants which I have included under this species also show variation in the color of spikelets: thus Chandler no. 1372, with deep brown scales, is in every respect a good match for the type specimen of *E. nigrescens*, and it grades into the somewhat lighter-scaled plants exemplified by Perrier de la Bâthie no. 17947 from Madagascar.¹ *E. Hildebrandtii* Boeckl. and *E. complanata* Boeckl.

¹ I here express my great appreciation to Dr. H. Chermezon of Strasbourg, the distinguished worker on the *Cyperaceae* of Madagascar, for his kindly help, and for an excellent series of specimens of *Eleocharis*.

have identical achenes, as C. B. Clarke long ago noted (Thiselton-Dyer, Fl. Trop. Afr. viii. 409 (1902)), and *E. complanata* (described by Boeckeler as only 2–5½ inches high) cannot greatly exceed *E. Hildebrandtii* in size. However, I may perhaps err in this disposition of *E. complanata*, which in its culms “valde compressis leviterque 3–4 sulcatis” shows an approach to *E. anceps*.

Typical *E. nigrescens* in the New World passes imperceptibly into plants having cylindrical spikelets with appressed scales which I treat here as

Var. **minutiflora** (Boeckl.) n. comb. (Pl. 462, FIGS. 8, 9). Culms filiform, erect, light green, often with fibrous bases, spongy to quadrangular-sulcate, 4–20 cm. high: sheaths usually marcescent, spikelets many-flowered, greenish, oblong-cylindric to elliptic, 1–3 (rarely 5) mm. long: scales white with a narrow green keel, often chestnut-tinged on the sides, acute to obtuse or emarginate, appressed, or sometimes spreading in fruit: achene as in typical *E. nigrescens*.—*E. minutiflora* Boeckl. in Engler, Bot. Jahrb. vii. 274 (1886); Kükenthal in Fedde, Rep. Spec. Nov. xxiii. 194 (1926). *E. microcarpa* C. B. Clarke in Urban, Symb. Ant. ii. 71 (1900); Britton & Wilson, Surv. Porto Rico & Virgin Isl. v.¹ 92 (1923), excl. syn.; not Torr.—West Indies, Yucatan. CUBA:¹ Prov. Santa Clara, at the mines of Motembo, hard somewhat moist soil, Ekman, no. 16857 (NY, S); C. Wright no. 3766 (G); Arroyo Mateo Sanchez, Pinar del Rio City, Ekman no. 17945 (S); C. Wright (distributed as *Scirpus paracicularis*) (NY). ST. THOMAS: in locis humidis gregaria, Krum Bay, Nov. 1881, Eggers no. 767 (NY);² Eggers, Krum Bay, no. 546 (ISOTYPE, in herb. Calif. Acad. Sci). YUCATAN: south of Villa Hermosa, Campeche, in tinal, C. L. Lundell no. 1143, Jan. 8, 1932 (distributed as *E. retroflexa*) (NY).

To Miss Eastwood of the California Academy of Sciences I am much indebted for the opportunity of examining a specimen of Eggers no. 546, the TYPE collection of *E. minutiflora*. The plants (5–7 cm. high) are especially characterized by narrow cylindrical green spikelets and somewhat swollen culm-bases, which have a whitened fibrous quality not easily described but perhaps the accumulated debris of basal spikelets or similar sheathing material. Ekman's specimens (no. 16857) are still smaller, with culms only 2–3 cm. high. The same plant is represented in a larger and somewhat more flaccid state by

¹ Ekman nos. 18979 and 17945 are in addition cited by Kükenthal (l. c.) from Cuba.

² This specimen represents a fragment of the collection in herb. Copenhagen, lent in 1930 by Dr. Ostenfeld to Dr. Britton, who up to the very last, maintained keen interest in the *Cyperaceae* and especially in the genus *Eleocharis*.

C. Wright's no. 3766 (G),¹ in which the culms may range as high as 14 cm. Some of the spikelets are tinged with brown as they are also in Lundell's gigantic specimen. The culms in the last-mentioned plant rise up to 20 cm. high from a ligneous turf-like aggregation of matted rootstocks. The basal scales of the elongated spikelets persist after the other scales have fallen.

Gardner no. 2373 (G) (from Piauí, Brazil (PL. 461, FIG. 8) distributed as *E. nigrescens*), has larger, rotund, grayish, rather deeply reticulate achenes. Although cited under *E. subfoliata* C. B. Clarke, it obviously does not belong with that species but represents either an extreme development of *E. nigrescens*, or a distinct species. *Löfgren's* no. 453 (distributed as *E. sulcata*) from Ceará, Brazil (US) appears to be the same as *Gardner* no. 2373.

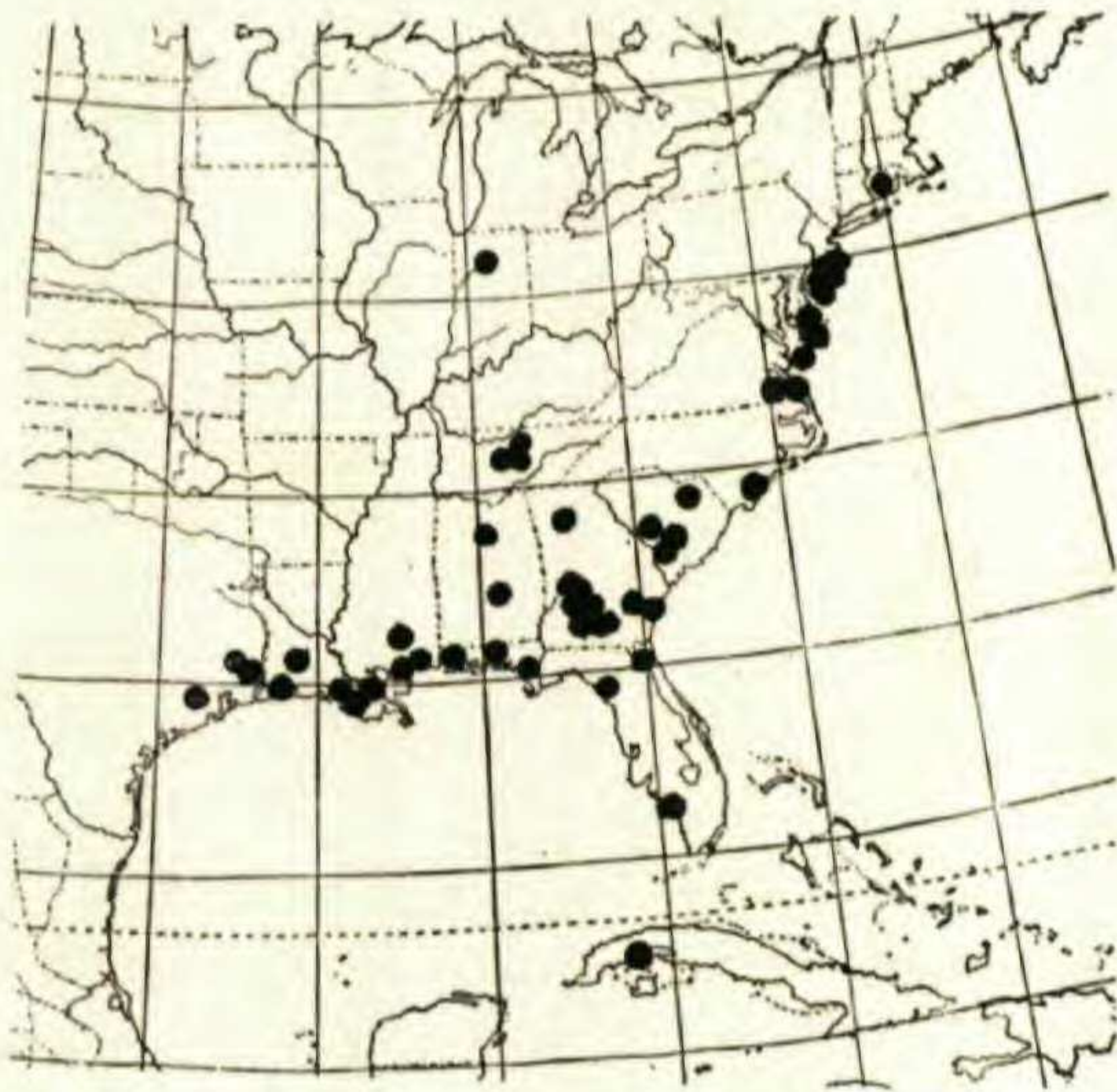
8. *E. SUBCANCELLATA* C. B. Clarke (PL. 461, FIG. 3). Cespitose, the rhizome, when present, white, branched-ascending: culms filiform, green, spongy, lightly punctate, sometimes quadrangular-sulcate, 2–7 cm. long: sheaths green to whitish, usually marcescent, the apex sometimes becoming filiform and divergent: spikelet many-flowered, 2–5 mm. long, scales greenish, keeled, with purplish to chestnut sides; style 3-fid: achene triangular, elliptic to obovate, 0.6–0.8 mm. long, strongly costate with truncate apex, whitish with a pearly lustre, lightly cancellate, with circular pitting: style-base narrow, depressed-apiculate: bristles rudimentary, united to form a cup-like base.—Kew Bull. Add. Ser. viii. 21 (1908).—MEXICO: Guadalajara, *Pringle* no. 3430 (TYPE K, NY); muddy places near Guadalajara, *Pringle* no. 7069 (G).

E. subcancellata was described as having culms 2–4 cm. long and spikelets scarcely 2 mm. long, but a fragment of the type sent from Kew to the New York Botanical Garden shows some spikelets approaching 4 mm. in length. This material is identical with the more robust specimen (culms up to 7 cm.; spikelets to 5 mm.) under *Pringle* no. 3430 (NY), a sheet which also includes specimens of *E. minima*. *Pringle* no. 4339 (B, NY) from Guadalajara (issued as *E. subcancellata*) is clearly *E. minima*. *E. subcancellata* is close to *E. nigrescens*, and should perhaps be included under that species.

9. *E. MICROCARPA* Torr. (PL. 460, FIG. 10; PL. 462, FIG. 14): MAP 7. Annual: culms 1–3 dm. high, *finely capillary: flexuous*, often quadrangular-sulcate: roots fibrous, white: sheaths inconspicuous, closely investing the culm, purple-striate at base, somewhat acuminate at

¹ This number is not listed in Sauvalle's *Flora Cubana*, but the material is identical with two sheets of the Wright collection (NY) labeled "*Sc. paracicularis*," hence the observation: "Species *H. paraciculari* (*Scirpus*) *Wright proxima*" by Boeckeler (l. c.).

apex: spikelets many-flowered, oblong to ovate, 2–7 mm. long: stamens 2 or 3: style 3-fid: scales loose, strongly keeled especially toward the apex, ovate, with a whitish margin, the green midrib bordered by brownish-red, somewhat acuminate, *all deciduous except the enlarged lowest scale which persists as a bract*: achene minute, 0.6–0.7 mm. long, (nearly 0.7 mm. in type), obovate, triangular, grayish-white or yellowish, smooth: *style-base low-conic*, gray, often reddish when young: bristles whitish to light brown, appressed, *less than half the length of*



MAP 7. Range of *ELEOCHARIS MICROCARPA*.

the achene.—Ann. Lyc. N. Y. iii. 312 (1836). *E. cubensis* Boeckl. Cyp. Nov. ii. 10 (1890). *E. nigrescens* Kükenthal in Fedde, Rep. Spec. Nov. xxiii. 194 (1926) in part.—South Carolina to Louisiana; western Cuba.—SOUTH CAROLINA: ponds, Santee Canal, Ravenel (as *E. acicularia*) (NY). GEORGIA: muddy margin of pine-barren pond, Sumter County, R. M. Harper no. 550 (NY); Leesburg, Earle in 1895 (NY); in bed of a brook, Sycamore, Turner County, Svenson no. 7336 (B); gravelly or muddy borders of small streams, near Acree, Worth County, Svenson no. 6963. FLORIDA: Fort Myers, Standley no. 14890 (NY); Jacksonville, Curtiss nos. 4088 (NY), 4800 (NY) and 5669 (G, NY); Wewahitchka, Chapman no. 2300a (G, NY); Chapman (NY); Rugel no. 279 (NY). MISSISSIPPI: Ocean Springs, Tracy no. 101 (NY). LOUISIANA: pine wood ponds on flat and wet glades, Calcasieu River, Carpenter no. 36 (NY); Covington, Arsène no. 11302 (G); New Orleans, Ingalls in 1834 (TYPE, NY). CUBA: road to Coloma, Pinar del Rio, Ekman no. 18251 (*E. nigrescens*, det. Kükenthal¹) (NY); C. Wright no. 3765 (NY) (TYPE coll. of *E. cubensis* Boeckl.) (G, NY). Passing, especially northward, into the

Var. *FILICULMIS* Torr. (PL. 460, FIG. 9). Culms a little *thicker*, *not flexuous*: scales *spreading*, keeled, strongly marked with purple on the sides: achenes 0.7–1 mm. long: style-base *conic-pyramidal*: bristles *opaque*, usually equalling the achene.—Ann. Lyc. N. Y. iii. 312 (1836). *E. Torreyana* Boeckl. Linnaea xxxvi. 440 (1869–70); Robinson & Fernald in Gray Man. ed. 7, 183, fig. 254 (1908); Britton & Brown, Ill. Fl. ed. 2, i. 316, fig. 775 (1913); Fernald, RHODORA xxxvii. 393 (1935).—Connecticut to Tennessee and Mississippi; also northern Indiana. CONNECTICUT: Voluntown, C. B. Graves in 1907 (G). NEW JERSEY: pine barrens, Austin (NY); Quaker Bridge, D. C. Eaton in

¹ Fedde, Rep. Spec. Nov. xxiii. 194 (1926)

1860 (G, NY); pine barrens, *Torrey* (TYPE, NY); Manahawkin, *Long* in 1909 (G); Egg Harbor, *H. A. Long* in 1905; Bennett, *Gershoy* no. 146 (in part) (G); Bennett, *Van Pelt* in 1908 (Ph); Cold Spring, *Long* no. 5709 (Ph); Winslow Junction, *Mackenzie* in 1921 (NY); Egg Harbor City, *Van Pelt* in 1906 (NY) and *Mackenzie* no. 5564 (NY); bogs near Bennett, *Mackenzie* no. 6564 (NY); Dennisville, *Mackenzie* in 1921 (NY); Woodbine, *Pennell* in 1906 (NY). DELAWARE: Ellendale, *Canby* (NY); Milton, *Britton* (NY); Pepper's Mill, Laurel, *Commons* (NY). MARYLAND: Salisbury, *Commons* (NY). VIRGINIA: wet peaty depressions in sandy pineland, Cape Henry, *Fernald & Long* no. 3761 (G). NORTH CAROLINA: Wilmington, *Canby* (NY); *M. A. Curtis* (two sheets, NY). SOUTH CAROLINA: Barnwell District, *Ravenel* (NY); Aiken, *Ravenel* in 1872 (NY); ditches in the low country, *M. A. Curtis* (NY); Hartsville, *W. C. Coker* (NY); *Elliott*, herb. Le Roy (NY). GEORGIA: Jesup, Wayne County, *Curtiss* nos. 3083 (G, NY), 6841 (NY); Leslie, Sumter County, *R. M. Harper* no. 421 (NY); shallow clear water, Muckalee Creek, Sumter County, *R. M. Harper* no. 533 (NY); shallow pools in granite quarries, Little Stone Mt., Dekalb County, *Svenson* no. 7505 (B). FLORIDA: *Chapman* (NY); De Funiack Springs, *Curtiss* no. 5927 (G, NY); *Buckley* in 1839 (NY). INDIANA: dry sandy roadside ditch, 2 miles S. E. of Tefft, Jasper County, *C. C. Deam* no. 46420 (D, G). TENNESSEE: in a dried-out bog, east of Altamont, Grundy County, *Svenson* no. 7337 (B); swamps and roadside pools, south of Jamestown, Fentress County, *Svenson* no. 7065 (B); muddy margin of a pond, Crossville, Cumberland County, *Svenson* no. 6912a (B). ALABAMA: Mobile, *Mohr* in 1868 (NY) and 1884 (NY); Cullman County, *Eggert* in 1897 (NY); Montgomery, *McCarthy* in 1888 (NY); De Soto Falls, *Ruth* no. 124 (NY). MISSISSIPPI: Biloxi, *Tracy* no. 3592 (NY).

Professor Fernald has pointed out (l. c.) that there is no specific distinction between *E. microcarpa* and *E. Torreyana*, and detailed study of these plants over a period of years has brought me to the same conclusion. There is, however, a marked difference in external appearance, typical *E. microcarpa* having culms as fine and flexuous as in the slenderest examples of *E. acicularis*, while the var. *filiculmis* has noticeably thicker and stiffer culms, giving the plants a strict and rigid appearance. The achenes of the two varieties show well-marked and fairly constant differences in size (achenes of the type collection of *E. microcarpa* average just under 0.7 mm.; those of the type of var. *filiculmis* average 0.8 mm. long), also in length of bristles and acuteness of the tubercle, but the color of scales seems to be of little importance. Though the var. *filiculmis* is the sole representative in the northern area, it infiltrates to some extent throughout the range of the species; whereas typical *E. microcarpa* is still unknown to me from

north of South Carolina. The collection (*Fernald & Long* no. 3761), cited from Virginia,¹ with achenes averaging 0.8 mm. long, bristles equalling the achene, and culms thick and rigid, would seem to me rather to belong with the var. *filiculmis*. Closely linked with *E. microcarpa* is a usually much taller plant with appressed whitened scales, and greenish-gray achenes with a depressed style-base, which may be called

Var. **Brittonii** n. comb. (PL. 460, FIG. 11). Culmis strictis, 1.5–10 dm. altis; squamis adpressis, obtusis, haud carinatis, albidis vel leviter brunneo-variegatis: achenio pyriformi, 0.6–0.8 mm. longo, ad basin valde contracto, obscure trigono, viridescenti-griseo, obscure reticulato, interdum atro-punctato: *stylobasi depressa apiculata*: setis brevibus frequenter translucetibus.—*E. Brittonii* Svenson ex Small, Man. 164 (1933). *E. tenuis* Schultes var. β Torr. Ann. Lyc. N. Y. iii. 310 (1836). *E. prolifera* Torr. Ann. Lyc. N. Y. iii. 315, 442 (1836), in part, especially p. 442. *E. microcarpa* Boeckl. Linnaea xxxvi. 439 (1869–70), e descr.—New Jersey to Louisiana and Texas. NEW JERSEY: Bennett, *Gershoy* no. 146 (in part) (G); *Long* no. 5120 (Ph), and O. H. Brown in 1915 (Ph). GEORGIA: Leesburg, *Earle* in 1895 (NY); moist pine barrens, Alapaha, *Curtiss* no. 6821 (G, NY); moist pine barrens, Sumter County, *R. M. Harper* no. 639 (G, NY); Leslie, Sumter County, *R. M. Harper* no. 407 (G); Darien Junction, McIntosh County, *Small* in 1895 (NY); in bed of a brook, Sycamore, Turner County, *Svenson* nos. 7332, (B), 7333 (B); mucky depressions in pine barrens, east of Sycamore, *Svenson* no. 7334 (B). FLORIDA: Cross City, *Small, DeWinkeler & Mosier* no. 11318 (NY); *Chapman, Eleocharis* sp. no. 3 (NY); Middle Florida, *Chapman* (as *E. prolifera*) (NY). ALABAMA: miry borders of ponds, ditches, Mobile, *Mohr* in 1895 (as *E. vivipara* Kunth) (NY); Mobile, *Sullivant* in 1848 (G). MISSISSIPPI: Augusta, *Tracy* no. 3406 (NY). LOUISIANA: moist pine land, Saint Tammany Parish, Abita Springs, *Pennell* no. 4199a (NY); New Orleans, *Ingalls* (TYPE, NY; type also of *E. tenuis* var. β Torr.) (NY); Covington, *Arsène* no. 12183 (NY); Tiger's Pt., W. La., *Langlois* in 1886 (NY); shallow ponds, pine woods, *Hale* no. 31 (G, NY). TEXAS: wet prairies, Houston, *E. Hall* no. 697 (June 12, 1872) (G, Ph, NY, Pom); *T. W. Thurow* in 1899 (NY); Corrigan, *Plank* in 1894 (NY); prairie near Indianola, *Ravenel* no. 95 (NY); Jasper County, *C. Wright* no. 125 (G).

This remarkable plant has the general appearance of a coarse extreme of var. *filiculmis*, but with flat scales usually of much lighter color, that remain appressed to the axis of the spikelet. In well-developed specimens, the pyriform obscurely-angled achene is a beautiful greenish gray (approximately *Court Gray* of Ridgway) with

¹ RHODORA xxxvii. 394. (1935).

rather clear reticulation and a flattened apiculate style-base, and with translucent bristles rarely exceeding half the length of the achene. Until I saw this plant growing with typical *E. microcarpa* in the long-leaf pine area of southwestern Georgia, I believed it to be a well-marked species. From robust specimens (such as *Harper* no. 639) with achenes up to 0.8 mm. long, the variety passes into the dwarf wiry plants (notably in Texas collections, cf. *E. Hall* no. 697) with brownish scales and slightly angular, often yellowish-speckled, achenes which are only 0.6 mm. long. The type of *E. tenuis* var. β Torrey, overlooked for so many years, is a large specimen closely resembling *Harper* no. 639; and here also, judging from Boeckeler's description, belongs *Drummond* no. 407 from New Orleans.

(to be continued)

NEW STATION OF *OXALIS MONTANA*, FORMA *RHODANTHA*.—While hiking the trail from the Town of Warren, New Hampshire, to the Three Ponds last June, I had the good fortune to discover a small colony of *Oxalis montana*, forma *rhodantha* Fernald. This plant appears to be locally distributed in the White Mountains and neighboring region. It has been collected at Chesterville, Maine, (*Miss Eaton*); Manchester, Vermont, (*Grout*); White Mountain Notch (*C. E. Faxon*); Mt. Adams, New Hampshire (*Schweinfurth and St. John* in 1911); and Eden, Lamoille County, Vermont (*C. H. Knowlton*).

This new colony, not exceeding one hundred plants, grows along the trail in a sphagnous depression on Mt. Carr, Warren, New Hampshire ($43^{\circ} 55' 18''$ N, $71^{\circ} 50' 6''$ W.) at an elevation of two thousand feet.

A few plants associated with this colony of *Oxalis* are: *Clintonia borealis*, *Coptis trifolia* and *Chiogenes hispidula*. Near it grow such trees as *Picea rubra*, *Abies balsamea*, *Betula lutea* and *Acer saccharum*. The species, although appearing nearby, seems not to mingle with its variety.

Specimens in my herbarium were verified as to their identification by Dr. O. E. Jennings and Dr. E. H. Graham of the Carnegie Museum Herbarium at Pittsburgh, Pennsylvania.—JOHN A. CHURCHILL, Pittsburgh, Pennsylvania.